

# METHOD FOR DETECTING PIEZOELECTRIC ELEMENT FAILURES IN HEAD SUSPENSIONS

## Cross Reference to Related Application

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9/22/04* This application is a division of Application No. 09/941,477 filed August 29, 2001, <sup>^</sup> now U.S. Patent No. 6,639,411, which claims the benefit of US Provisional Application No. 60/230,029, filed September 5, 2000. The entire contents of Application Nos. 09/941,477 and 60/230,029 are hereby incorporated by reference.

## Background of the Invention

Microactuated suspensions are generally known and disclosed, for example, in the Krinke et al. U.S. Patent 6,046,888. Figure 1 is an illustration of one such microactuated suspension 30. The embodiment shown in Figure 1 has an actuator or motor 32 formed by a pair of piezoelectric (PZT) elements 34, 36 for rotating or otherwise driving a load beam 38 with respect to a baseplate 40 in response to electric drive signals. Piezoelectric materials are also widely used as transducers of mechanical motion into electrical energy.

The piezoelectric elements are typically mounted to the suspension by adhesive. Adhesive fractures sometimes develop during the manufacturing process. As a result of these fractures, the piezoelectric elements are not properly mounted to the suspension, and will not function properly. Fractures are also sometimes present in the piezoelectric elements themselves, and can also prevent the microactuator from functioning properly. Still other microactuator failures occur when the piezoelectric elements are depoled, when the elements are oriented or electrically interconnected with the same polarity, and when the bonds between the drive signal lead wires and the element terminals are broken.

Known testing approaches for identifying motor failures include resistance and stroke tests. There remains, however, a continuing need for improved motor failure test methods and associated systems. Methods and systems which are capable of being efficiently performed and which can accurately identify a wide range of failures would be particularly desirable.